UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/841,447	04/24/2001	Scott Lee Wellington	5659-01000 TH1934	4711

7590 06/16/2003

DEL CHRISTENSEN
SHELL OIL COMPANY
P.O. BOX 2463
HOUSTON, TX 77252-2463

EXAMINER
KRECK, JOHN J

ART UNIT	PAPER NUMBER
3673	

DATE MAILED: 06/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/841,447	WELLINGTON ET AL.
	Examiner	Art Unit
	John Kreck	3673

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 March 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *947-1016* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) *951,962,978,988,1005 and 1009* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 20,22,24 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

The amendment dated 3/31/03 has been entered.

Claims 947-1016 are pending.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 947-950, 952, 953, 955, 956, 966-971, 972, 973, 976, 977, 979, 980, 982, 983, 989, 993-995, 996-1001, 1004, 1007, 1010, and 1014-1016 are rejected under 35 U.S.C. 102(b) as being anticipated by Alleman (U.S. Patent number 2,786,660).

Alleman teaches the method of treating a hydrocarbon formation including the steps of heating a portion of the formation to a temperature sufficient to support oxidation; flowing an oxidant; reacting the oxidant with hydrocarbons and transferring heat as called for in claim 947. Alleman also shows the heat source zone and pyrolysis zone radially spaced from the axis of the wellbore—see, for example figure 6, where the wellbore is shown at 96, while the heating and pyrolysis is at 98. The heat source zone is the zone where combustion (an exothermic reaction) is taking place; the pyrolysis zone is the zone immediately adjacent to the combustion. With regards to the allowing heat to transfer by conduction; this is not explicitly taught by Alleman, however, this is inherent since the coal includes solid material. Since the ambient temperature of the

coal seam is less than the heating temperature, heat transfer will inherently take place, and the heat will transfer by conduction, since in solid material, the primary mode of heat transfer is by conduction.

Alleman also teaches the temperature above about 400°C as called for in claim 948.

Alleman also teaches the critical flow orifices (83, 84) as called for in claim 949.

Alleman also teaches the removing reaction products as called for in claim 950.

With regards to claim 952; the diffusion is inherent.

Alleman also teaches heating with reaction products as called for in claim 953.

Alleman also teaches the air as called for in claim 955.

Alleman also teaches the fluid free of nitrogen (oxygen) as called for in claim 956.

With regards to claims 966 and 967; the increase in permeability is inherent.

With regards to claims 968; the greater than 60% yield is inherent.

Alleman also teaches the well along strike as called for in claims 969-971.

Regarding independent claim 972:

Alleman teaches the method of treating a hydrocarbon formation including the steps of heating a portion of the formation to a temperature sufficient to support oxidation; flowing an oxidant; reacting the oxidant with hydrocarbons and transferring

heat with the reaction products being removed as called for in claim 972. The single hydrocarbon layer is shown at 92 in figure 6.

Alleman also teaches the temperature above about 400°C as called for in claim 973.

Alleman also teaches the critical flow orifices (83, 84) as called for in claim 976.

Alleman also teaches the removing reaction products as called for in claim 977.

With regards to claim 979; the diffusion is inherent.

Alleman also teaches heating with reaction products as called for in claim 980.

Alleman also teaches the air as called for in claim 982.

Alleman also teaches the fluid free of nitrogen (oxygen) as called for in claim 983.

With regards to claim 989; the conduction is inherent.

With regards to claims 993 and 994; the increase in permeability is inherent.

With regards to claims 995; the greater than 60% yield is inherent.

Regarding independent claim 996:

Alleman teaches the method of treating a hydrocarbon formation including the steps of heating a portion of the formation to a temperature sufficient to support oxidation; providing an oxidizing fluid; allowing the oxidizing fluid to react with hydrocarbons and transferring heat with the reaction products being removed as called for in claim 996. With regards to the allowing heat to transfer by conduction from the heat source zone abut[ting] the pyrolysis zone; this is not explicitly taught by Alleman,

however, this is inherent since the coal includes solid material. The heat source zone is the zone where combustion (an exothermic reaction) is taking place; the pyrolysis zone is the zone immediately adjacent to the combustion. Since the ambient temperature of the coal seam is less than the heating temperature, heat transfer will inherently take place, and the heat will transfer by conduction, since in solid material, the primary mode of heat transfer is by conduction.

With regards to claim 997; the diffusion is inherent.

Alleman also teaches the orifices (83, 84) as called for in claim 998.

Alleman also teaches the critical flow orifices (83, 84) as called for in claim 999.

Alleman also teaches the conduit in the opening and the removing oxidation products as called for in claim 1000.

Alleman also teaches the conduit in the opening and the removing oxidation products and transferring heat as called for in claim 1001.

Alleman also teaches the center conduit and outer conduit in the opening and the removing oxidation products and transferring heat as called for in claim 1004.

With regards to claim 1007; the pyrolysis zone adjacent to the heat zone is inherent.

With regards to claim 1010; the conduction is inherent.

With regards to claims 1014 and 1015; the increase in permeability is inherent.

With regards to claims 1016; the greater than 60% yield is inherent.

2. Claims 947, 948, 950, 952, 953, 955, 956, 966, 967, 968, 972, 973, 977, 979, 980, 982, 983, 989, 993, 994, 995, 996, 997, 1000, 1001, 1007, 1010, 1014, 1015, and 1016 are rejected under 35 U.S.C. 102(b) as being anticipated by Terry, et al. (U.S. Patent number 4,093,025).

Terry teaches the method of treating a hydrocarbon formation including the steps of heating a portion of the formation to a temperature sufficient to support oxidation; flowing an oxidant; reacting the oxidant with hydrocarbons and transferring heat as called for in claim 947. Terry also shows the heat source zone and pyrolysis zone radially spaced from the axis of the wellbore—see, for example figure 4, where the axis of wellbore is near 12, while the heating and pyrolysis clearly occur in the coal. The heat source zone is the zone where combustion (an exothermic reaction) is taking place; the pyrolysis zone is the zone immediately adjacent to the combustion. With regards to the allowing heat to transfer by conduction; this is not explicitly taught by Terry, however, this is inherent since the coal includes solid material. Since the ambient temperature of the coal seam is less than the heating temperature, heat transfer will inherently take place, and the heat will transfer by conduction, since in solid material, the primary mode of heat transfer is by conduction.

Terry also teaches the temperature above about 400°C as called for in claim 948.

Terry also teaches the removing reaction products as called for in claim 950.

With regards to claim 952; the diffusion is inherent.

Terry also teaches heating with reaction products as called for in claim 953.

Terry also teaches the air as called for in claim 955.

Terry also teaches the fluid free of nitrogen (oxygen) as called for in claim 956.

With regards to claims 966 and 967; the increase in permeability is inherent.

With regards to claims 968; the greater than 60% yield is inherent.

Regarding independent claim 972:

Terry teaches the method of treating a hydrocarbon formation including the steps of heating a portion of the formation to a temperature sufficient to support oxidation; flowing an oxidant; reacting the oxidant with hydrocarbons and transferring heat with the reaction products being removed as called for in claim 972. Although Terry also shows simultaneous pyrolysis of a second coal seam in figure 5; the gasification shown using the apparatus in figure 4 inherently includes pyrolysis; thus heating and pyrolysis zones are present in the coal seam undergoing gasification.

Terry also teaches the temperature above about 400°C as called for in claim 973.

Terry also teaches the removing reaction products as called for in claim 977.

With regards to claim 979; the diffusion is inherent.

Terry also teaches heating with reaction products as called for in claim 980.

Terry also teaches the air as called for in claim 982.

Terry also teaches the fluid free of nitrogen (oxygen) as called for in claim 983.

With regards to claim 989; the conduction is inherent.

With regards to claims 993 and 994; the increase in permeability is inherent.

With regards to claims 995; the greater than 60% yield is inherent.

Regarding independent claim 996:

Terry teaches the method of treating a hydrocarbon formation including the steps of heating a portion of the formation to a temperature sufficient to support oxidation; providing an oxidizing fluid; allowing the oxidizing fluid to react with hydrocarbons and transferring heat with the reaction products being removed as called for in claim 996. With regards to the transfer of heat by conduction from the heat source zone which abuts the pyrolysis zone, this is inherent in the coal seam under gasification since the coal includes solid material. The heat source zone is the zone where combustion (an exothermic reaction) is taking place; the pyrolysis zone is the zone immediately adjacent to the combustion. Since the ambient temperature of the coal seam is less than the heating temperature, heat transfer will inherently take place, and the heat will transfer by conduction, since in solid material, the primary mode of heat transfer is by conduction.

With regards to claim 997; the diffusion is inherent.

Terry also teaches the conduit in the opening and the removing oxidation products as called for in claim 1000.

Terry also teaches the conduit in the opening and the removing oxidation products and transferring heat as called for in claim 1001.

Terry also teaches the center conduit and outer conduit in the opening and the removing oxidation products and transferring heat as called for in claim 1004.

With regards to claim 1007; the pyrolysis zone adjacent to the heat zone is inherent.

With regards to claim 1010; the conduction is inherent.

With regards to claims 1014 and 1015; the increase in permeability is inherent.

With regards to claims 1016; the greater than 60% yield is inherent.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 953, 990, 1002, 1003, and 1011 rejected under 35 U.S.C. 103(a) as being unpatentable over Alleman.

Alleman teaches all of the limitations of claims 947, 972, and 996; from which these claims depend.

Alleman fails to teach the conductivity greater than 0.5W/m°C.

It is well known that most coals have thermal conductivities greater than 0.5W/m°C; thus it would have been obvious to one of ordinary skill in the art at the time of the invention to have practiced the method of Alleman in a coal seam with a thermal conductivity greater than 0.5W/m°C as called for in claims 953, 990, and 1011. With

regards to the increase of conductivity, this is inherent; see figure 5 on page 275 of "Fuel a journal of Fuel Science" (applicant's citation A255).

Alleman also teaches the conduit, but fails to teach the flow rate of the oxidizing fluid approximately equal to the flow rate of the products. It would have been obvious to one of ordinary skill in the art at the time of the invention to have practiced the Alleman method so that the flow rate of the oxidizing fluid approximately equal to the flow rate of the pro, ducts, as called for in claim 1002, in order to prevent pressure build-up.

Alleman also teaches the conduit, but fails to teach the controlling the pressure between the oxidizing fluid and the product. It would have been obvious to one of ordinary skill in the art at the time of the invention to have practiced the Alleman method with the step of controlling the pressure between the oxidizing fluid and the product, as called for in claim 1003, in order to prevent pressure build-up.

4. Claims 954 and 981 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alleman in view of Bain, et al. (U.S. Patent number 5,008,085).

Alleman teaches all of the limitations of claims 947 and 972; from which these claims depend.

Alleman fails to teach the hydrogen peroxide.

Bain teaches that hydrogen peroxide is useful in a similar process, based on the nature of the reactants (col. 8, lines 16-25).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Alleman method to have used hydrogen peroxide in

place of air or oxygen, as called for in claims 954 and 981, based on the nature of the hydrocarbons and the desired end products.

5. Claims 958, 959, 960, 964, 974, 975, 986, 991, 1006, and 1012 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terry, et al.

Terry teaches all of the limitations of claims 947, 972, and 996; from which these claims depend.

Terry fails to explicitly disclose the pressure, but teaches that the pressure should balance the hydrostatic head. It is well known that the hydrostatic head is greater than 2 bar in many coal seams. It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Terry method to have the pressure greater than about 2.0 bar, as called for in claims 964, 991, and 1012, based on existing hydrostatic head.

Terry fails to teach the electric heater. It is well known in the art to use electric heaters to initiate combustion underground. Electric heating is advantageous because it can be tightly controlled. It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Terry method to have used electrical heater as called for in claims 958, 974, and 1006, in order to carefully control the heating.

Terry fails to teach the exhaust from a surface burner. It is well known in the art to use exhaust from a surface burner to initiate combustion underground. Heating using the exhaust from a surface burner is advantageous because it is relatively inexpensive.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Terry method to have used exhaust from a surface burner as called for in claims 959 and 975, in order to reduce expenses.

Terry fails to teach the flameless distributed combustor. It is well known in the art to use heat from a flameless distributed combustor to initiate combustion underground. Heating using flameless distributed combustor is advantageous because it allows for high temperatures. It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Terry method to have used a flameless distributed combustor as called for in claims 960 and 986, in order to allow for a higher temperature.

6. Claims 957, 984, and 985 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terry, et al '025 in view of Terry, et al. (U.S. Patent number 4,099,567).

Terry '025 teaches all of the limitations of claims 947, 972, and 996; from which these claims depend. Terry fails to teach the upper limit to the temperature.

Terry '567 teaches that it is desirable to keep the temperature below the fusion temperature of the coal. It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the method of Terry '025 to have limited the oxidant to keep the temperature below about 1200°C (and also to have therefore inhibited the formation of nitrous oxides) as called for in claims 957, 984, and 985; based on the properties of the coal formation.

7. Claims 961, 987, and 1008 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terry in view of Elkins (U.S. Patent number 2,734,579).

Terry fails to teach the controlling the temperature and pressure wherein the temperature is controlled as a function of the pressure or the pressure is controlled as a function of the temperature.

Elkins teaches controlling the pressure in order to lower the temperature (col. 3, line 46); this is done in order to help prevent overheating. It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Terry process to have included the temperature is controlled as a function of the pressure or the pressure is controlled as a function of the temperature as called for in claim 2431, and as taught by Elkins, in order to prevent overheating.

Allowable Subject Matter

8. Claims 951, 962, 978, 988, 1009, and 1005 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA

1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. Claims 951, 962, 965, 978, 988, 992, 1005, 1009, and 1013 have been identified as including subject matter which is allowable over the prior art; thus a double patenting rejection is being made at this time over copending applications which have already been allowed.

2. Claims 965, 992, and 1013 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over copending Application Nos. 09/840,937; 09/841,288; and 09/841,445. Although the conflicting claims are not identical, they are not patentably distinct from each other because the differences are obvious. Each of these copending applications has an independent claim which generally corresponds to a claim in the instant application. The copending applications do not call for the specific features of the heating; however these claimed features are obvious (as set forth in the 102 rejections above).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Argum nts

3. Applicant's arguments filed 3/31/03 have been fully considered but they are not persuasive.

Applicant has argued that "Alleman does not appear to teach or suggest at least the features of '*allowing heat to transfer substantially by conduction from the heat source zone to a pyrolysis zone in the formation to pyrolyze at least a portion of the hydrocarbons in the pyrolysis zone*'" This is not persuasive. First, this limitation is not found in claim 972. Second, the transfer of heat by conduction is inherent in a solid substance such as coal. Alleman clearly teaches the heat source zone (see column 6, line 19: "it is then preferred to admit air or oxygen from line 68 under increased pressure causing localized burning of the coal in seam 16 adjacent jets 26." This area of "localized burning" is the heat source zone. The (undisclosed, but inherent) pyrolysis zone is adjacent to the combustion.

With regards to claims 949, 976, and 999; applicant has failed to provide any structural features of the claimed "critical flow orifices" which differentiate them from the radial flow jets disclosed by Alleman. The jets are clearly orifices, and they clearly allow flow. It is apparent that the flow through the jets is critical, since the Alleman invention would not operate without said flow.

Regarding claims 966, 967, 993, 994, 1014, and 1015; with regards to applicant's request for basis in fact or technical reasoning to support the assertion that the increase in permeability is inherent; it is readily apparent that the injection of hot air and/or combustion increase the permeability by pyrolyzing and/or oxidizing/combusting

some of the coal. Coke, for example, is well known to have permeability in excess of 100md.

With regards to applicant's arguments concerning the Terry reference, they are not persuasive.

Terry clearly shows the heat source zone and pyrolysis zone radially spaced from the axis of the wellbore—see, for example figure 4, where the axis of wellbore is near 12, while the heating and pyrolysis clearly occur in the coal. The heat source zone is the zone where combustion (an exothermic reaction) is taking place; the pyrolysis zone is the zone immediately adjacent to the combustion. With regards to the allowing heat to transfer by conduction; this is not explicitly taught by Terry, however, this is inherent since the coal includes solid material. Since the ambient temperature of the coal seam is less than the heating temperature, heat transfer will inherently take place, and the heat will transfer by conduction, since in solid material, the primary mode of heat transfer is by conduction.

Regarding claims 972 and 996; although Terry also shows simultaneous pyrolysis of a second coal seam in figure 5; the gasification shown using the apparatus in figure 4 inherently includes pyrolysis; thus heating and pyrolysis zones are present in the coal seam undergoing gasification.

With regards to claims 953, 990, and 1011; see figure 5 on page 275 of "Fuel a journal of Fuel Science" (applicant's citation A255) which clearly shows increasing thermal conductivity with temperature. Thus the increase is not "unexpected".

With regards to claims 954 and 981; applicant has cited selected lines from the Bain reference; however these citations do not contradict the teaching of Bain "The oxidizing agent is a material which rapidly exothermically oxidizes the hydrocarbon feed under chosen reaction conditions. The agent is selected so that essentially all of the agent reacts with the feed. Various oxidizing agents are suitable for use in this process. Such agents include, but are not limited to oxygen and hydrogen peroxide. (col. 8, line 16). In response to applicant's argument that Bain's teaching of hydrogen peroxide is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the hydrogen peroxide "exothermically oxidizes the hydrocarbon". This is the same purpose of the oxygen in the Alleman or Terry processes.

With regards to claims 964, 991, and 1012; applicant has cited selected lines from the Terry reference; however these citations do not contradict the teaching of Terry that pressure should be used to counteract hydrostatic head; see col. 8, lines 48-51:

"the preferred oxidizer is oxygen from a conventional oxygen supply Plant 101, FIG. 1, provided for this purpose. A suitable mine pressure is selected, for example the pressure necessary to balance the hydrostatic head."

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Kreck whose telephone number is (703)308-2725. The examiner can normally be reached on M-F 6:00 am - 3:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Heather Shackelford can be reached on (703)308-2978. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3597 for regular communications and (703)305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)306-4177.

JJK
June 12, 2003

DAVID BAGNELL
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600